

New Exotic Crane-Flies (Tipulidae: Diptera). Part V

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The preceding part under this general title was published in ENTOMOLOGICAL NEWS, 72: 235-243, 1961. In the present report I am continuing the studies on the very rich fauna of India, describing species that were taken in Kumaon and Sikkim by Dr. Fernand Schmid, and in South India by Mr. P. Susai Nathan, to both of whom my sincere thanks are extended. The types are preserved in my personal collection.

Rhabdomastix (Sacandaga) teriensis, new species

Size small (wing of male 4 mm or less); general coloration of head and thorax gray; wings weakly tinged, without stigma; veins pale brown, *Sc* long, vein *2nd A* sinuous, the cell broad; veins unusually glabrous; male hypopygium with outer dististyle slender; interbase on outer third expanded into a narrow blade, its tip somewhat obtuse.

♂. Length about 3-3.5 mm; wing 3.5-4 mm; antenna about 0.7-0.8 mm.

♀. Length about 4-5.5 mm; wing 3.5-5 mm.

Rostrum light gray; palpi black. Antennae black, scape pruinose; all flagellar segments distinct, suboval, shorter than the verticils. Head light gray; anterior vertex broad.

Pronotum brownish gray. Mesonotum gray, praescutum with vague indications of four darker stripes, the intermediate pair broader and more evident; pseudosutural foveae large, black. Pleura gray, more brownish gray ventrally. Halteres whitened, especially the knobs. Legs with coxae and trochanters brownish testaceous; remainder of legs brownish yellow, outer tarsal segments narrowly or scarcely darker. Wings weakly tinged, without a distinct stigma; veins pale brown, somewhat lighter in the prearcular and costal fields. Veins unusually glabrous, beyond the cord with a scattered series of

¹ Contribution from the Entomological Laboratory, University of Massachusetts.

trichia on outer two-thirds or more of vein R_5 and a few near outer end of M_{1+2} ; Sc and R glabrous. Venation: Sc long, Sc_1 ending just beyond midlength of Rs , Sc_2 preserved; vein R_3 erect, the distance on costa between R_{1+2} and R_3 variable, longer than vein R_3 ; $m-cu$ at or near midlength of M_{3+4} ; vein 2nd A gently sinuous, the cell broad.

Abdomen dark brown, in cases the posterior borders of segments narrowly paler; hypopygium and genital segment of ovipositor light brown. Ovipositor with cerci long and slender, slightly upcurved on outer half. Male hypopygium with the outer dististyle slender, with a concentration of short darkened spicules at tip but without a major terminal spine; inner style moderately broad, outer margin before apex with long setae from strong tubercles. Interbase slender, weakly expanded on about the outer third into a narrow blade, the tip somewhat obtuse.

Habitat. INDIA (Kumaon). *Holotype*: ♂, Teri, Teri Garhwal, 2,500–5,000 feet, April 16, 1958 (Fernand Schmid). *Allotopotype*: ♀, pinned with type. *Paratopotypes*: 7 ♂♀.

The other small regional members of the subgenus, including *Rhabdomastix* (*Sacandaga*) *almorae* Alexander and *R. (S.) emodicola* Alexander, are most readily told by the structure of the male hypopygium, particularly the outer dististyle and interbase. In the paratype series a single female is considerably larger than the others (the largest measurements given) but seems to be conspecific.

Toxorhina (Ceratocheilus) monostyla, new species

Size medium (wing of male 5.7 mm); mesonotum brown and yellow, pleura conspicuously patterned; rostrum longer than body or wing; knobs of halteres dark brown; legs dark brown, outwardly passing into black; wings infuscated; macrotrichia lacking on most veins basad of cord; cell M_2 open by atrophy of m ; male hypopygium without lobes on basistyle; a single dististyle.

♂. Length, excluding rostrum, about 6 mm; wing 5.7 mm; rostrum about 7 mm.

Rostrum black, very long, exceeding the wing or remainder of body. Antennae with scape light yellow; pedicel black,

flagellum brownish black. Head gray, without a corniculus; anterior vertex narrow, subequal to the diameter of scape.

Cervical region black. Mesonotum chiefly concealed in mounting; praescutum and scutum dark brown, more obscure brownish yellow laterally; parascutella obscure yellow; postnotum dark plumbeous. Pleura chiefly dark brown or plumbeous, especially above where it produces a broad longitudinal stripe; sternopleurite lighter brown, paling to yellow posteriorly; metapleura darkened. Halteres with stem light brown, knob dark brown. Legs with fore and hind coxae light yellow, very small, middle coxae darker; trochanters brownish yellow; femora dark brown, paler basally; remainder of legs black. Wings rather strongly infuscated, base slightly more yellowed; veins brown. Macrotrichia on R_s , both sections of R_5 , second section of M_{1+2} and outer two-thirds of M_3 ; a single trichium on anterior branch of R_s ; no trichia on Sc , M , Cu or the Anals. Venation: Sc_1 ending opposite origin of R_s , Sc_2 removed from tip; anterior branch of R_s long, gently sinuous, longer than either R_s or basal section of R_5 , ending beyond level of $r-m$; cell M_2 open by atrophy of m ; M_{3+4} subequal to M_4 ; $m-cu$ at fork of M .

Abdomen dark brown, hypopygium more yellowish brown. Male hypopygium without modified lobes on basistyle, its mesal face with numerous normal setae, the outer ones small and very abundant. A single dististyle that includes a narrow yellow beak, its tip obtusely truncated, and a dark colored oval posterior prolongation that terminates in an apiculate point. Interbasal plates pale, gradually widened outwardly, tips obtuse. Arms of aedeagus darkened, relatively short, less than the beak of the dististyle.

Habitat. INDIA (Sikkim). *Holotype:* ♂, Dikchu, 2,300 feet, May 9, 1959 (Fernand Schmid).

Toxorhina (Ceratocheilus) monostyla is readily told from all regional species by the open cell M_2 of the wings and, especially, the structure of the male hypopygium, particularly the basistyle and dististyle.

***Toxorhina (Ceratocheilus) luteibasis*, new species**

Size medium (wing of male about 6 mm); rostrum short; general coloration of mesonotum brownish black, including

three broad praescutal stripes; pleura with dorsal sternopleurite silvery; halteres light yellow; legs black, femoral bases obscure yellow; wings tinged with brown, the base conspicuously yellowed; macrotrichia of veins beyond cord relatively sparse; *Sc* long, cell 1st M_2 closed; male hypopygium with basistyle conspicuously setiferous; dististyle complex, including a long sinuous outer spine; interbase unusually broad.

♂. Length, excluding rostrum, about 6.5 mm; wing 6.1 mm; rostrum about 3.2 mm.

Rostrum black, relatively short, only about one-half the remainder of body. Antennae black throughout. Head gray, darkened on sides posteriorly, orbits gray; a depressed median area behind the antennal bases, slightly elevated on either side, with no cornicular development; anterior vertex broad, more than twice the diameter of the large antennal pedicel.

Cervical region and pronotum black. Mesonotal praescutum almost covered by three broad brownish black stripes, the interspaces obscured, a little paler than the stripes, lateral borders narrowly gray; posterior sclerites of notum blackened, slightly paler along posterior border of scutum and on the parascutella. Pleura above brownish black, broadly silvery gray on dorsal sternopleurite, paler behind; meral region darkened. Halteres conspicuously pale yellow. Legs with coxae brownish black; trochanters brown; remainder of legs black, femoral bases obscure yellow, more extensively pale on fore femora. Wings tinged with brown, prearcular field conspicuously yellowed; veins brown, yellowed in the brightened areas. Macrotrichia of veins much less numerous than in *brevifrons*, beyond cord lacking on *Rs*, basal section of R_5 , M_3 and M_4 ; about 15 trichia on outer two-thirds of distal section of R_5 , more crowded on distal fifth; outer section of M_{1+2} with about 12 trichia, chiefly on distal half. Venation: *Sc* long, Sc_1 ending nearly opposite midlength of the straight *Rs*, Sc_2 before origin of the latter; anterior branch of *Rs* long and only gently sinuous, more than twice *Rs*; *m-cu* at or close to fork of *M*.

Abdomen, including hypopygium, black. Male hypopygium with posterior border of tergite low convex; setae small and sparse. Basistyle stout, with conspicuous setae; in the slide

mount it is uncertain as to where these setal groups are located but apparently as follows: A conspicuous tubercle on lateral or outer face beyond midlength of style, provided with about 18 to 20 strong dark setae; more distally near apex of style with a low dense area of shorter setae; inner face of style with well-distributed strong setae; remainder of style without setae or with these more scattered. A single contorted and complex dististyle, the moderately long beak obtuse, its base behind narrowed and roughened; at base of style with a long sinuous spine, narrowed to the acute tip. Interbase unusually broad, on outer two-thirds narrowed to the subacute tip. Arms of aedeagus shorter than the basal mass.

Habitat. INDIA (Sikkim). *Holotype:* ♂, Chateng, 8,700 feet, May 22, 1959 (Fernand Schmid).

Toxorhina (Ceratocheilus) luteibasis is most similar to *T. (C.) brevifrons* (Brunetti), differing in the coloration of the body and wings, the short rostrum, broad anterior vertex and the trichiation of the wing veins. The type specimen of *brevifrons* has been studied and re-described by the writer (*Philippine Jour. Sci.* 61: 202; 1936).

***Toxorhina (Toxorhina) scita*, new species**

Size relatively large (wing of male about 5.5 mm); mesonotum brown, lateral praescutal borders broadly buffy; thoracic pleura brownish yellow with a conspicuous darker brown dorsal stripe; legs brown; wings weakly tinged with brown, unpatterned; Sc_1 ending opposite origin of R_s ; abdominal tergites dark brown; male hypopygium with setae of mesal face of basistyle normal; aedeagus blackened, arms narrow.

♂. Length, excluding rostrum, about 6 mm; wing 5.4–5.5 mm; rostrum about 5 mm.

♀. Length, excluding rostrum, about 7.5 mm; wing 6 mm.

Rostrum elongate, as shown by the measurements, black throughout. Antennae with scape and the large pedicel dark gray; flagellum brown, unusually short. Head gray, more cinnamon behind the antennal bases, darker brown behind the more silvery corniculus; anterior vertex broad.

Pronotum and cervical region dark brown. Mesonotal praescutum with disk virtually covered by three confluent brown stripes, the interspaces faintly indicated, more evident behind, lateral borders broadly buffy; scutum dark brown, the posterior callosities more yellowed; scutellum brown, posterior border narrowly paler brown; mediotergite light gray. Pleura and pleurotergite brownish yellow, with a conspicuous darker brown dorsal stripe; ventral sternopleurite more reddish brown. Halteres with stem obscure whitish, knob darker. Legs with coxae and trochanters light brown; remainder of legs brown. Wings weakly tinged with brown, unpatterned, prearcular and costal fields slightly more yellowed; veins light brown. Macrotrichia on the branch of R_s , M_{1+2} and distal half of M_3 . Venation: Sc_1 ending opposite origin of R_s ; outer end of cell R_5 slightly narrowed; $m-cu$ at or close to fork of M .

Abdominal tergites, with the hypopygium, dark brown; basal sternites paler brown. Male hypopygium with posterior margin of tergite rounded. Basistyle simple, setae of mesal face normal, relatively numerous and extending over virtually the entire surface. Dististyles terminal, the outer style a narrow sinuous rod, narrowed very gradually into a slender spine; inner style a little longer, at near midlength with a stout pendant spine. Gonapophysis broadly flattened. Aedeagus blackened, arms slender, separated by a broad U-shaped notch.

Habitat. INDIA (Madras). *Holotype:* ♂, Cherangode, Nilgiri Hills, 3,500 feet, November 13, 1950 (P. Susai Nathan). *Allotopotype:* ♀. *Paratopotype:* ♂, pinned with the type.

Toxorhina (Toxorhina) scita differs from other Indian species of the subgenus by the larger size, coloration of body and especially in the structure of the male hypopygium.

***Toxorhina (Toxorhina) sparsiseta*, new species**

Size small (wing of male 5.5 mm or less); general coloration of head and mesothorax gray, praescutum with four more plumbeous stripes; legs black; wings weakly darkened, base more yellowed; macrotrichia of veins sparse; abdomen, including hypopygium, brownish black; male hypopygium with tergal plate blackened, bilobed; basistyle with major setae simple, long

but sparse, including a compact group of four near apex; outer dististyle a strongly curved yellow rod; arms of aedeagus short, slender, divergent.

♂. Length, excluding rostrum, about 5 mm; wing 4.5–5.5 mm; rostrum about 3.5–4 mm.

♀. Length, excluding rostrum, about 6.5–7 mm; wing 5.5–6 mm; rostrum about 3.5–4 mm.

Rostrum black, about three-fourths as long as wing. Antennae black. Head light gray; anterior vertex without a well-developed corniculus, broad, especially in the female.

Cervical region and pronotum blackened. Mesonotum light gray, the praescutum with four more plumbeous stripes, intermediate pair narrowly separated, the laterals in front virtually confluent with the central stripes; scutal lobes similarly darkened. Pleura dark plumbeous. Halteres dusky. Legs with coxae strongly infuscated basally, tips obscure yellow; trochanters obscure yellow; remainder of legs black, the femoral bases vaguely paler. Wings weakly darkened, base more yellowed; veins pale brown. Macrotrichia of veins long but very sparse, beyond cord with about five or six on approximately the distal half or more of both R_5 and M_{1+2} , present on outer half of R , lacking on Sc . Venation: Sc_1 ending about opposite origin of R_s , Sc_1 long; $m-cu$ close to fork of M .

Abdomen, including hypopygium, brownish black. Ovipositor with genital shield light brown apically; cerci dark brown horn color, long and slender, gently upcurved. Male hypopygium with the tergal plate blackened, bilobed, the lobes rounded, longer in the holotype. Basistyle with unusually few setae, especially the larger more basal ones; all setae simple, not bulbous, as in *incerta*; near apex with a compact group of four strong curved bristles. Outer dististyle a strongly curved yellow rod, narrowed to the acute tip; inner style darkened, tip broadly obtuse, on outer margin at near midlength with a strong erect to slightly recurved spine. Arms of aedeagus short, slender, divergent.

Habitat. INDIA (Madras). *Holotype:* ♂, Cinchona, Anaimalai Hills, 3,500 feet, May 1959 (P. Susai Nathan). *Allo-*

topotype: ♀, pinned with type. *Paratopotypes*: ♂♀, May 1956; April–May 1959 (P. Susai Nathan).

The most similar regional species is *Toxorhina* (*Toxorhina*) *brevirama* Alexander, readily told by the structure of the male hypopygium, particularly the tergite, vestiture of the basistyle, and the inner dististyle.

Three New Species of Trichoptera from Eastern North America

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Although the following caddisflies come from relatively distant localities they appear to share the same ecological requirement of cool, clear, rapid, streams such as are provided in the heart of the temperate deciduous forest. The species of *Sericostoma* finds these conditions in a spring-fed stream some distance from an area which normally has small, clear, cold streams of surface origin.

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Types described in this paper are deposited in the collection of the Illinois Natural History Survey.

Hydropsyche hoffmani n. sp.

Male.—Length 11 mm. Color various shades of light brown; antennae almost straw color with the dorsal dark V-marks conspicuous and contrasting on the six basal segments of the flagellum, fading out on the seventh and eighth segments; wings with a poorly contrasting irregular pattern of various shades of brown. General structure typical for genus. Eyes fairly large, the malar space narrow, the eye occupying almost the entire lateral view of the head, and seen dorsally, each eye as large as the area of the head between the eyes. Genitalia as in Fig. 1. Ninth segment with a pronounced dorsal hump, tenth segment